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FEDERAL SPECIFICATION

SPRAY OUTFITS, PAINT, PORTABLE

The General Services Administration has authorized the use of this specification by all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers two types of portable paint spray outfits.

1.2 Classification. The paint spray outfits shall be of the following types, as specified (see 6.2):

Type A - Standard.
Type B - Lightweight.

2. APPLICABLE DOCUMENTS

2.1 Other publications. The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply.

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any data which may improve this document should be sent to: Commanding Officer (Code 15E2), Naval Construction Battalion Center, 1000 23rd Avenue, Port Hueneme, CA 93043-4301, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME PTC 9	- Performance Test Code for Displacement Compressors, Vacuum Pumps and Blowers.
ASME BPVC 9	- Rules for Construction of Pressure Vessels.
ASME B1.1	- Screw Threads (UN and UNR Thread Form) Unified Inch.
ASME B40.1	- Gauges - Pressure Indicating Dial Type-Elastic Element

(Private sector and civil agencies may purchase copies of these voluntary standards from the American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, NY 10017.)

AMERICAN SOCIETY FOR QUALITY CONTROL (ASQC)

ASQC Z1.4	- Procedures, Sampling and Tables for Inspection by Attributes.

(Private sector and civil agencies may purchase copies of these voluntary standards from the American Society for Quality Control, P.O. Box 3005, 611 E. Wisconsin Ave., Milwaukee, WI 53201-4606.)

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE C2	- National Electrical Safety Code.

(Private sector and civil agencies may purchase copies of these voluntary standards from the Institute of Electrical and Electronics Engineers, IEEE Service Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331.)

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA MG-1	- Motors and Generators.

(Private sector and civil agencies may purchase copies of these voluntary standards from the National Electrical Manufacturer's Association, 2101 L Street, N.W., Washington, DC 20037.)

UNDERWRITERS LABORATORIES INC. (UL)

UL-498	- Attachment Plugs and Receptacles.
UL-817	- Cord Sets and Power Supply Cords.
UL-1450	- Standard for Safety Motor-Operated Air Compressors, Vacuum Pumps, and Painting Equipment Second Edition.

(Private sector and civil agencies may purchase copies of these voluntary standards from the Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.)

(DoD activities may obtain copies of those adopted voluntary standards listed in the DoD Index of Specifications and Standards free of charge from the Defense Automated Printing Services, Attn: DoDSSP, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Order of precedence. In the event of a conflict between the text of this document and the references cited, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Standard commercial product. The spray outfit shall, as a minimum, be in accordance with the requirements of this specification and shall be the manufacturer's standard commercial product. Additional or better features which are not specifically prohibited by this specification, but which are a part of the manufacturer's standard commercial product, shall be included in the spray outfit being furnished. A standard commercial product is a product which has been sold or is being currently offered for sale in the commercial market through advertisements or manufacturer's catalogs, or brochures, and represents the latest production model.

3.1.1 System of measurement. The dimensions used in this specification are not intended to preclude the use of the metric system of measurement in the fabrication and production of the material, individual parts, and finished product, provided form, fit, and function requirements are satisfied.

3.2 First article. When specified (see 6.2), the contractor shall furnish a spray outfit of the type, as required for first article inspection and approval (see 4.2.1 and 6.3).

3.3 Materials. Materials used shall be free from defects which would adversely affect the performance or maintainability of individual components or of the overall assembly. Materials not specified herein shall be of the same quality used for the intended purpose in commercial practice. Unless otherwise specified herein, all equipment, material, and articles incorporated in the work covered by this specification are to be new and fabricated using materials produced from recovered materials to the maximum extent possible without jeopardizing the intended use. The term "recovered materials" means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. Unless otherwise specified, none of the above shall be interpreted to mean that the use of used or rebuilt products are allowed under this specification.

3.4 Design. The design of the paint spray outfit shall be in accordance with current engineering practice. Parts of the paint spray outfit shall be the supplier's current design. All parts shall be of such size, material, and strength as to sustain the maximum loads imposed with an adequate factor of safety, work efficiency, and with minimum wear during operation. The outfits and accessories supplied shall be designed for minimum maintenance with a minimum of special tools for maintenance operations. The design shall permit ready access for repair and service.

3.4.1 Interchangeability. All spray outfits of the same classification furnished with similar options under a specific contract shall be identical to the extent necessary to ensure interchangeability of component parts, assemblies, accessories, and spare parts.

3.5 Construction. Construction shall be free of any characteristics or defects that will prevent the paint spray outfits from passing any of the examinations and tests specified in section 4. The paint spray outfits shall be complete so that when connected to the specified source of power, can be used for any operation for which they were designed.

3.5.1 Threads. All threaded fasteners shall be in the inch system and shall comply with ASME B1.1.

3.5.2 Hose connections, gun. Unless otherwise specified (see 6.2), air and material hose connections shall be male straight pipe thread with 60-degree bevel taper seat, or adapters shall be furnished for these sizes. The air hose connection shall be 1/4-inch (8 mm) NPS. The material hose connection shall be 3/8-inch (10 mm) NPS. The air hose connection shall be detachable, fabricated from brass, or from corrosion-resistant steel. The connection shall be in the butt of the grip, and shall be removable for replacement, or be of the permanently inserted type.

3.5.3 Hose couplings. The hose couplings shall be made of nonferrous metal. They shall be of the swivel joint types; those for the material or fluid hose shall have 3/8-inch (10 mm) female threads, and those for air hose shall have 1/4-inch (8 mm) female threads (see 3.5.2). In instances where more than two lengths of material or fluid hose or air hose are specified, a suitable male threaded connector threaded on both ends shall be furnished for connecting each additional length of hose. All couplings shall be of the reusable type which can be removed from hose on which supplied and replaced on other lengths of hose without special tools or additional parts.

3.5.4 Hoses. Hoses shall be of commercial grade and material acceptable for intended use and as specified herein.

3.6 Gun.

3.6.1 Material. Except as otherwise specified herein, the gun shall be made of heat-treated, lightweight, nonferrous metal such as aluminum, magnesium, or similar metals or their alloys. Fiber packing or washers shall not be used where they will come in contact with the paint compounds.

3.6.2 General design. The guns shall be air pressure spray type and shall be designed to spray vertical, horizontal, overhead, and intermediate surfaces with paint, varnish, enamel, shellac, and other fast drying or setting materials having viscosities of 15 and 30 seconds, using a No. 4 Ford cup at 77 degrees Fahrenheit (°F) (25 degrees Celsius (°C)). The guns shall be as light in weight as practical, consistent with reliability. The design shall be such that paint compounds will not come in contact with the air control parts. The gun shall be easy to clean, simple to adjust, and so designed and constructed as to produce complete atomization and uniform spray of paint compounds. The weight of the gun shall be not greater than 2 pounds (0.9 kilograms (kg)).

3.6.2.1 Body. The gun body shall be constructed to withstand designed usage while supporting all other parts of the gun. It shall have an integral hand grip designed to fit the operator's hand and maintain balance with the air and material hoses connected. The body shall be in the general shape of a pistol with grip suitable for two or more finger trigger control. A hook shall be provided at the top of the body for hanging the gun when not in use. The gun shall withstand pressure tests specified in 4.5.5.

3.6.2.2 Nozzle. The nozzle assembly shall consist essentially of an air cap, material needle valve and fluid nozzle, and auxiliary parts. The nozzle provided shall be specially designed for use with the gun to be furnished with the type outfit specified. The nozzle assembly and parts, when size permits, shall be permanently and legibly marked with the original manufacturer's size or spray pattern designation.

3.6.3 Performance. When the spray guns and equipment are operated under test conditions specified in section 4, they shall produce a smooth, continuous, penetrating film of the sprayed material. Spraying shall be effected without an excessive loss of thinners, solvents, or drying agents in off spray or mist.

3.7 Type A, standard spray outfit.

3.7.1 General. Spray outfits of this type shall consist essentially of a gun, pressure tank, pressure cup, two lengths of air hose, two lengths of material hose, and when specified (see 6.2), a nozzle extension, oil and moisture separator, extension gun or handle, and a tank truck, shall be furnished (see 3.7.3, 3.7.7, 3.7.8, and 3.10). The outfit shall be designed to withstand a pressure of not greater than 100 pounds per square inch (psi) (689 kilopascal (kPa)) without distortion of any part, except the pressure cup.

3.7.2 Gun. The gun shall be of the general purpose, heavy-duty, siphon-pressure type (see 3.6.1 to 3.6.3 inclusive). The gun shall be suitable in all respects for volume production spraying. It shall be designed and fabricated to withstand without leakage or deformation, an air pressure of 250 psi (1 723 kPa) (see 4.5.5). Guns shall be not greater than 6 cubic feet per minute (ft^3/min) (0.002 83 cubic metre per second (m^3/s)) air consumption at 30 pounds per square inch gage (psig) (206 kPa (gage)). Threaded parts of wear-resistant brass, bronze, or aluminum which are subject to frequent attachment and detachment in normal service, shall have strength and abrasion resistance not less than that of brass. Threaded parts shall be replaceable. All working parts and removable hose connections shall be replaceable by the use of common hand tools. The gun shall consist essentially of a body, a head, the necessary parts for a nozzle assembly, air and material valves, trigger, and hose connection. This gun shall be suitable for operation from quart cup or pressure tank.

3.7.2.1 Body. The gun body shall conform to the requirements of 3.6.2.1.

3.7.2.2 Head. The head of the gun shall be either detachable or form an integral part of the gun body, as specified (see 6.2). If the head is detachable, it shall be accurately machined and designed for positive alignment. Special tools shall not be required for removing or tightening the

head. The head, whether integral or detachable, shall provide support and correct alignment for nozzle parts. The exterior surfaces of the head shall be finished with a buffed metallic protective coating.

3.7.2.3 Nozzle. The nozzle shall conform to the requirements of 3.6.2.2.

a. Air cap. The air cap shall provide suitable air openings for complete atomization without splattering or splitting the spray pattern (see 4.5.2.1), and shall be held fast to the gun head by means of a retaining ring. It shall be so designed as to provide a uniform spray under all normal working conditions.
b. Fluid nozzle. The fluid nozzle shall provide a precision fit with the fluid needle to ensure a positive shutoff, without any leakage of the paint compound when the trigger is released (see 4.5.1.1a). The nozzle and needle shall be made of corrosion-resisting metals. Interior surfaces affecting material flow such as the fluid orifice, and exterior surfaces affecting air flow, shall be smooth finished and free of imperfections such as burrs or projections, to reduce interference with flow of air and material to a minimum.
c. Auxiliary parts. Baffle plates, tension washers, retainer rings, and other auxiliary parts, as required, shall be provided.

3.7.2.4. Material and air valves. The material and air valves shall be operated by the trigger, and shall be held normally, closed by coil springs enclosed within the gun body. Valves shall provide cut-off of paint compound and normal shut-off of air (see 4.5.1.1a). Valve stems and needles shall be made of steel. Valve packing shall be treated leather, graphite, or other suitable material.

a. Material valve. The material valve shall be of the needle type, not less than 0.125-inch (3.17 mm) in diameter, and shall be made of corrosion-resisting metal. It shall be machined to close fit to preclude binding.
b. Air valve. The air valve shall be of the cartridge or of the spring seated type, which shall increase its seating efficiency under pressure.

3.7.2.5 Trigger. The trigger shall be designed for two or more finger control, and shall operate to permit holding fingers in a normal position when spraying and aid in balancing the gun. The trigger control shall be positive and shall operate to permit flow of air before material flow, and shut-off of air. The trigger shall contain a hardened steel plate at points of contact with valve stems, or it shall be otherwise designed for minimum wear.

3.7.2.6 Connections and fittings. Connections and fittings shall conform to the requirements of 3.7.6. The material hose connection shall be located underneath the head or body, and so positioned as to allow use of a siphon or pressure feed cup or hose connection from pressure feed tank.

3.7.2.7 Air flow control. Suitable means shall be provided in the gun for maintaining adjustment of the spray. Means of adjusting air flow for forcing atomized paint into the spray pattern shall be located in a position convenient to the operator. It shall be possible to adjust this air flow without

stopping the spraying operation. The fluid needle and valve seat shall have a Rockwell hardness of 44 to 54 on the Rockwell "C" scale (see 4.5.2.3).

3.7.2.8 Spray pattern control. The gun shall be fitted with an external mix and adjustable nozzle that will deliver a round or fan shaped spray pattern (horizontal or vertical), as required. The gun shall be adjustable to regulate the volume, size, and shape of the spray pattern quickly without disconnecting the gun, exchanging nozzles, or the use of tools. The adjustment of both the nozzle and the gun shall be maintained without chance of accidental change while the gun is in operation.

3.7.3 Nozzle extension. When specified (see 6.2), the nozzle extension shall be not less than 18 inches (457.2 mm) long, shall be easily attached to the spray gun, and shall be suitable for spraying any materials suitable for use in the gun. The nozzle, internal or external mix, shall produce a standard fan-shaped spray pattern. The extension shall be made of lightweight corrosion-resisting metal, and shall produce results equal to those obtained with the gun alone.

3.7.4 Tank and accessories. The tank and accessories shall be in accordance with the requirements of this specification (see 3.9 to 3.9.5).

3.7.5 Cup. The cup shall be made of nonferrous metal. It shall have a capacity of not less than 1 quart (0.95 litre (L)), and shall be of seamless construction. It shall be so designed that it may be attached quickly and securely to the gun in such manner that there will be no possibility of the cup coming loose unintentionally, and that when cup and cover are attached, there shall be formed an air-tight and liquid-tight joint at operating pressures. If a gasket is required between the cup and the cover, a spare gasket shall be furnished. The cup shall be constructed to withstand 50 psig (344 kPa (gage)) air pressure (see 4.5.5). The cover shall be fitted with a 0.375-inch threaded (see 3.5.5) swivel connection, female, with 60-degree bevel taper seat, for securely attaching cup to material connection of the gun. The cover of the cup shall be fitted with a material tube which shall extend into the cup, just clearing the bottom of the cup when cover is secured in place. This material tube shall be made of adequate size to handle materials specified. If connection is threaded, the cover shall be of sufficient strength to hold the cup, gasket (if used), and cover in positive engagement. The cup opening shall be of sufficient size to permit easy cleaning of the interior, and shall be not less than 2.7 inches (68.6 mm) in diameter. A safety valve shall be located in the cup cover, or such valve shall be provided elsewhere in the outfit.

3.7.6. Air hose. The air hose shall have a 0.312-inch (7.92 mm) diameter bore and shall be furnished in 25-foot (7.6 metre (m)) lengths. Couplings shall be provided at each end of each length of hose for attaching hose to gun and tank. Hose with couplings attached shall be so constructed as to withstand an air pressure of 150 psi (1 034 kPa) (see 4.5.5).

3.7.6.1 Material or fluid hose. Unless otherwise specified (see 6.2), the material or fluid hose shall be provided with 0.375-inch (9.52 mm) nominal diameter bore and shall be furnished in 25-foot (7.6 m) lengths. Couplings shall be provided at each end of each length of hose for attaching hose to gun and tank. Hose with couplings attached shall be constructed to withstand a working pressure of 100 psi (689 kPa) (see 4.5.6).

3.7.7 Oil and moisture separator. The separator shall be suitable for removing residual amounts of oil, water, scale, and other foreign matter from the compressed air in the supply line. The separator shall be arranged for mounting on wall, pipe standard, or integral with the paint spray equipment. The body and filter devices shall be corrosion-resisting. The separator shall be so designed that it may be disassembled for periodic cleaning or replacing the filtering device and reassembled for use. The separator shall be so designed that it will not require adjustment of any kind or fail to function in normal use.

3.7.7.1 Regulators. The regulators shall be capable of adjusting air pressure from 5 to 90 psi (34 to 620 kPa). Capacity of the regulator shall be such that the required volume of air will be delivered at the prescribed regulated pressure. Material for the body shall have a tensile strength of not less than 30,000 psi (206 842 kPa). The body material may also be wrought aluminum alloy having high corrosion resistance and a tensile strength of not less than 30,000 psi (206 842 kPa).

3.7.7.2 Gages. Gages shall conform to ASME B40.1. One gage shall be mounted on each regulator to indicate regulated pressure and one gage shall be mounted to indicate main line air pressure. Regulated pressure gage shall indicate 0-100 psig (0-689 kPa (gage)). Main line gage shall indicate 0-200 psig (0-1 378 kPa (gage)).

3.7.8 Extension guns and handles. When specified (see 6.2), the extension gun or handle for use in painting ceilings, walls, trusswork, and similar surfaces, shall be made of nonferrous metal and shall be light in weight and properly balanced for ease of operation. The parts shall be firmly fastened, making a rigid unit which shall be self-supporting and of sufficient strength for operation without excessive deflection or permanent set. With the extension gun or handle, the operator shall be able to produce results equal in all respects to those obtained when using the gun alone.

3.7.8.1 Extension handle. The extension handle shall consist of two passages, one for air and one for paint, together with trigger actuating mechanism for controlling the action of the trigger of the gun from the operator's end of the extension handle. The gun end of the handle shall be designed for mounting of a standard hand type gun. This end of the handle shall be of such shape that when the gun is attached, the nozzle of the gun shall be tilted not less than 40 degrees nor more than 45 degrees above the horizontal plane when the main body of the handle is held perpendicular to the horizontal plane. Male threaded nipples or adapters shall be provided for this size for the air connection (see 3.5.2). Handles shall be furnished in 3-, 4-, 6-, 8-, or 10-foot (0.9 m, 1.2 m, 1.8 m, 2.4 m, or 3.0 m) lengths, as specified (see 6.2).

3.7.8.2 Extension gun. These guns shall consist essentially of the manufacturer’s standard tip and nozzle only, connected to a controlling means by a fluid tube and an air tube. A positive mechanism for controlling the flow of material or fluid and air shall be in close proximity to the hands of the operator. The design of these guns shall be such that extension of control to the nozzle end of the extension is not required. The nozzle shall be mounted at an angle of not less than 40 degrees nor more than 45 degrees above the horizontal plane when the main body of the extension is held perpendicular to the horizontal plane. Extension guns, complete with controlling mechanism and tube, shall be so constructed that rigidity is attained with minimum weight. The

end of the extension to which the hoses are to be attached shall be fitted with 3/8-inch (10 mm) male threaded nipples, or adapters shall be provided for this size for the material or fluid connection, and 1/4-inch (8 mm) male threaded nipples or adapters shall be furnished for this size for the air connection (see 3.5.2). Extension guns shall be furnished in 4-, 6-, 8-, or 10-foot (1.2 m, 1.8 m, 2.4 m, or 3.0 m) lengths as specified (see 6.2).

3.8 Type B, lightweight spray outfit.

3.8.1 General. Spray outfits of this type shall consist essentially of a light duty gun, pressure cup, air hose, air compressor, compressor motor, and air pulsation tank or chamber or other means to ensure a smooth flow of air without pulsation. When specified (see 6.2), material hose and material (paint) pressure feed tank shall be included.

3.8.2 Gun. The gun shall be of the pressure type, either internal or external atomizing, and shall be equipped with three interchangeable nozzles, one for round spray pattern, one for fan spray pattern, and one for 45-degree, angular spray pattern. The gun shall consist essentially of a body and necessary parts for a nozzle assembly, air connection, material valve, and a trigger. Air and material passages shall be adequate for the maximum air and material demand required for satisfactory spraying with a minimum drop in pressure. This gun shall be suitable for operation from both a quart cup and a pressure tank.

3.8.2.1 Body. The gun body shall be made of material having a tensile strength of not less than 30,000 psi (206 842 kPa). The fluid nozzle, fluid needle, and air cap parts shall be of the removable and replaceable type, and shall be precision machined to fit the gun body. They shall be permanently and legibly marked for identification and replacement.

3.8.2.2 Nozzle. The fluid nozzle shall be in accordance with 3.7.2.3.

3.8.2.3 Connections. The gun shall be provided with a 1/4-inch (8 mm) fitting for the air connections, or adapters shall be furnished for this size (see 3.5.2).

3.8.2.4 Material valve. The material valve shall be operated by the trigger, and shall be held normally closed by a coil spring enclosed within the gun body. The valve shall seat to provide cut-off of liquid (see 4.5.1.1). Valve stem and needle shall be made of corrosion-resistant steel. Valve packing shall be treated leather, graphite, or other suitable material.

3.8.2.5 Trigger. The trigger shall be similar to that of 3.7.2.5. The gun shall be adjustable to regulate the volume of the spray quickly without disconnecting the gun, or the use of any special tools, and adjustment shall be maintained without chance of accidental change while the gun is in operation.

3.8.3 Cup. The cup shall be made of nonferrous metal. It shall have a capacity of not less than one quart (0.946 L), and shall be of the pressure type. It shall be designed that it may be attached quickly and securely to the gun in such manner that there will be no possibility of the cup coming loose unintentionally. The cup shall be constructed to withstand an air pressure of 50 psi

(344 kPa). If a gasket is required between the cup and cover, two shall be supplied; one of these to be retained as a maintenance part. The cup and cover shall be so designed and constructed that when attached to each other, an air and liquid-tight joint at operating pressure shall be formed. The cup opening shall be of sufficient size to permit easy cleaning of the interior, and shall be not less than 2.25 inches (57.15 mm) in diameter.

3.8.4 Hose. When the outfit is intended for use with cup only, one 15-foot (4.6 m) length of air hose shall be supplied. Where a material pressure feed tank is to be supplied (see 6.2), two 15-foot (4.6 m) lengths of air hose and one 15-foot (4.6 m) length of material (fluid) hose shall be supplied.

3.8.4.1 Air hose. The air hose shall be 0.25-inch (6.35 mm) inside diameter. Working pressure shall be not less than 200 psig (1 378 kPa (gage)). Burst pressure shall be not less than four times the working pressure.

3.8.4.2 Material hose. The material or fluid hose shall have a 3/8-inch (10 mm) inside diameter.

3.8.5 Air compressor. Except as otherwise specified herein, the compressor shall be in accordance with UL 1450. The compressor shall have a displacement of not less than 2.7 ft^3/min (0.000 127 m^3/s), and shall be capable of attaining a pressure of not less than 80 psi (551 kPa). The compressor shall produce air at 50 psig (344 kPa (gage)). At this pressure, actual delivery shall be not less than 1.5 ft^3/min (0.000 71 m^3/s) free air. At 40 psig (276 kPa (gage)), the capacity shall be not less than 1.7 ft^3/min (0.000 80 m^3/s) free air. This requirement is intended to indicate the required capacity of the compressor and not the pressure at which the paint spray outfit is to be operated. When the paint spray outfit is operated, the compressor shall produce adequate volume and pressure of air for continuous spraying of the materials specified in 3.6.2, with the quality of application specified in 3.6.3 (see 4.5.1.2). The compressor shall be designed and constructed to prevent building up uncontrolled pressure above the structural strength of the outfit. The compressor shall successfully complete the tests specified in 4.5.3.1 to 4.5.3.1b inclusive.

3.8.6 Electrical requirements.

3.8.6.1 Electric motor. The motors shall be not less than 1/3 horsepower (248 watts), designed for operation on the power supply specified (see 6.2), and shall have adequate power to provide the volume and pressure of air specified in 3.8.5 in continuous operation without exceeding the allowable temperature rise of 104 °F (40 °C) for an open type, and of 131 °F (55 °C) for a totally enclosed explosion-proof type. Motors shall conform to NEMA MG-1. Class and style shall be as specified. Motors shall be equipped with ball bearings.

3.8.6.2 Switch. Each paint spray outfit shall be provided with a start-stop motor control switch. The switch shall be rated to agree with the motor rating as indicated on the identification plate. When specified (see 6.2), switch enclosures shall be provided for use in hazardous atmosphere, and shall conform to the requirements of IEEE C2 for class I, division 2 locations.

3.8.6.3 Cable assembly. Each unit shall be furnished with a cable assembly as an integral part of the equipment. Cable assembly shall consist of not less than 15 feet (4.6 m) of three-conductor commercial SO, ST, SJO, or SJT cable, as required for the motor size furnished, and an attachment plug cap conforming to UL-498 requirement for two pole, 3-wire ground devices rated 15 amperes, 125 volts.

3.8.7 Receiver of pulsation chamber. Means shall be provided to minimize pressure surges in the discharge from the compressor. This shall consist of an external receiver or moisture separator, or of a built-in pulsation chamber. The receiver, moisture separator, and pulsation chamber shall be designed to withstand 150 psi (1 034 kPa) (see 4.5.3.1). A drain cock and a safety valve set for a pressure of not greater than 50 psi (344 kPa) shall be provided. A moisture separator in the discharge air line will be satisfactory.

3.8.8 Base. The air compressor, compressor motor, receiver, and pulsation chamber, as applicable, shall be mounted compactly on a common base and shall be provided with a handle or other suitable device for carrying by one person. The base shall be equipped with four cushioned rubber feet constructed to prevent the unit from creeping or scuffing when in operation.

3.8.9 Material (paint) pressure feed tank. When furnished, the material (paint) pressure feed tank shall be in accordance with 3.9 through 3.9.5, except that the agitator and the regulator are not required. Tank without welded chime will be acceptable and fittings may be limited to suitable air intake, air and fluid outlets, safety valve (set for a pressure of not greater than 75 psi (517 kPa)), and relief valve. The tank shall be 2-gallon (7.6 L) size and have a capacity for not less than 1.5 gallons (5.7 L) of paint material. A "D" shaped handle will be acceptable.

3.9 Material-pressure feed tank. The material-pressure feed tank shall be designed and constructed in accordance with ASME Rules for Construction of Pressure Vessels, to withstand a test pressure of not less than 150 psi (1 034 kPa). The dimensions of the tank shall be such that, with the cover assembly and fittings in place, there will be no tendency toward top-heaviness, even when the tank is empty. The tank shall be made of corrosion-resistant steel, or heavily galvanized inside and outside, or otherwise treated to have equal corrosion resistance. It shall be cylindrical in shape, with welded-in bottom chime, and shall be of the removable paint container type. The paint container shall be easily and quickly lifted out when the cover is removed from the tank. Unless otherwise specified (see 6.2), one container shall be furnished with each tank. The tanks shall be furnished in sizes from 2 to 15 gallons (7.6 to 56.8 L), as specified (see 6.2). The 2-gallon (7.6 L) tank shall have not less than 0.5-gallon (1.9 L) capacity for paint materials, and the 15-gallon (56.8 L) tank shall have not less than 13-gallon (49.2 L) capacity for paint materials. Intermediate sizes shall have capacities in direct proportion. All tanks, except 2-gallon (7.6 L) size on which "D" type handle will be acceptable, shall have two metal handles near the top of the tank diametrically opposite each other. The handles and means of attachment shall be of such strength that a capacity fill of paint may be lifted without noticeable deflection or permanent set.

3.9.1 Cover. The tank cover shall be designed to provide a sealed closure for the tank size specified and shall provide for assembly of the agitators and required fittings. The cover shall

comply with the ASME Rules for Construction of Pressure Vessels, and shall withstand a test pressure of not less than 150 psi (1 034 kPa). If made of steel, it shall be heavily galvanized inside and outside or otherwise treated to have equal corrosion resistance. The cover shall be fastened by quick acting clamps, or other equally suitable means for easy and quick installation and removal from the tank. The cover shall incorporate a gasket or other suitable means of providing a leakproof pressure seal.

3.9.2 Agitator. When specified (see 6.2), an air-driven or hand-driven agitator shall be installed as part of the cover assembly. The agitator shall be capable of thorough agitation of the paint materials, preventing any settling of the pigments, solvents, or thinners. Air-motor-driven agitators shall have provision for agitation speed adjustment and for shutting off the air motor.

3.9.3 Filler opening. Covers for 5-gallon (18.9 L) or larger capacity tanks may have a filler opening so that painting materials can be added without removal of the tank cover. The filler opening cap on such covers shall be attached with quick acting means, not subject to accidental loosening, which will provide a pressure-tight seal at working pressures. The material filler cap shall have a small hole drilled in the threads to allow slow release of pressure during removal of the cap, to prevent its removal without prior pressure release, as a safety feature.

3.9.4 Tank accessories. The following accessories shall be provided either on the cover of the tank or in some other position readily accessible to the operator:

a. Pressure regulator for governing the atomizing pressure of the gun (0 - 100 psig (0 - 689 kPa(gage)) (see 3.7.7.1).
b. Pressure regulator for controlling the material through the hose to the gun (0 - 100 psig (0 - 689 kPa(gage)) (see 3.7.7.1).
c. Gage for indicating the atomizing pressure (see 3.7.7.2).
d. Gage for indicating the pressure in the tank (see 3.7.7.2).
e. Relief valve.
f. Safety valve shall be ASME nonadjustable type, set to automatically blow off when the pressure in the tank reaches not less than 100 psig (689 kPa(gage)) or not greater than 120 psig (827 kPa(gage)).
g. Air and material shutoff valves.
h. Paint strainer on material pickup tube.

3.9.5 Connections. The connections on the tank to which the hoses are to be connected shall be 3/8-inch (10 mm) male threaded nipples for the fluid or material hoses, and 1/4-inch (8 mm) male threaded nipples for the air hoses, or adapters shall be provided for these sizes (see 3.5.2).

3.10 Tank truck. When specified (see 6.2), a tank truck shall be furnished. The truck, if practical, shall be separate from the tank, but if designed as an integral part of the tank, the truck shall have suitable means of locking when necessary to prevent rolling.

3.11 Identification marking. Identification shall be permanently and legibly marked directly on the spray outfit or on a corrosion-resisting metal plate securely attached to the spray outfit at the

source of manufacturer. Identification shall include the manufacturer's model and serial number, name, and trade mark to be readily identifiable to the manufacturer.

3.11.1 Marking of gun parts. Parts, the size of which permit, shall be marked in a plain and permanent manner with the name of the original manufacturer and the model number, or with the manufacturer's trademark of such known character that the source of manufacture may be readily determined. When parts, the size of which do not permit proper marking, are required as replacements, they shall be enclosed in individual packages marked.

3.12 Instruction plates. The spray outfits shall be equipped with instruction plates suitably located, describing any special or important procedures to be followed in operating and servicing the equipment. Plates shall be of a material which will last and remain legible for the life of the equipment. Plates shall be securely affixed to the equipment with nonferrous screws or bolts of not less than 0.125-inch (3.17 mm) diameter.

3.13 Treatment and painting. Unless otherwise specified (see 6.2), the spray outfits shall be treated and painted in accordance with the manufacturer's standard practice. All surfaces of the spray outfits other than corrosion-resisting steel shall be protected against corrosion and present a neat appearance.

3.14 Workmanship. The workmanship shall be in accordance with the requirements specified herein and shall comply with all quality assurance provisions of section 4 of this specification.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract, the contractor may use his or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to ensure that supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this document shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in this document shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.1.2 Component and material inspection. Components and materials shall be inspected in accordance with all the requirements specified herein and in applicable referenced documents.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.2.1)
b. Quality conformance inspection (see 4.2.2)

4.2.1 First article inspection. The first article inspection shall be performed on spray outfits when a first article is required (see 3.2, 6.2, and 6.3). This inspection shall include the examination of 4.4 and the tests of 4.5. The first article may be either a first production item or a standard production item from the supplier's current inventory provided the item meets the requirements of the specification and is representative of the design, construction, and manufacturing technique applicable to the remaining items to be furnished under the contract.

4.2.2 Quality conformance inspection. The quality conformance inspection shall include the examination of 4.4 and the tests of 4.5. This inspection shall be performed on the samples selected in accordance with 4.3.

4.3 Sampling. Sampling and inspection procedures shall be in accordance with ASQC-Z1.4. The unit of product shall be one complete spray outfit. All spray outfits offered for delivery at one time shall be considered a lot for the purpose of inspection. If an inspection lot is rejected, the contractor may rework it to correct the defects, or screen out the defective units, and resubmit for a complete reinspection. Resubmitted lots shall be reinspected using tightened inspection. If the reject lot was screened, reinspection shall be limited to the defect causing rejection. If the lot was reprocessed, reinspection shall be performed for all defects. Rejected lots shall be separated from new lots, and shall be clearly identified as reinspected lots.

4.4 Examination. Each spray outfit shall be examined for defects listed in table I. Each attribute within each classification of multiple defects shall constitute one defect.

Table I. Classification of defects.

Classification	Defect	Requirement paragraph
Major	2.5 percent defective.	
101	Type not as specified.	1.2
102	Component parts missing, damaged, or not as specified.	3.7.1, 3.8.1
103	Threaded connections, dimensions not as specified.	3.5.2, 3.5.3
Minor	4 percent defective.	
201	Identification marking not complete.	3.11

4.4.1 Tests for quality conformance. Each sample selected (see 4.3) shall be tested for compliance with the requirements of this specification. Acceptable Quality Level shall be

2.5 percent defective. Nonconforming outfits shall not be offered for delivery and if the number of defective units exceeds the acceptable number for the samples tested, the lot represented shall be rejected. Quality conformance tests shall consist of the tests specified (see 4.5.2).

4.5 Tests.

4.5.1 Performance tests.

4.5.1.1 Leakage tests.

a. Test on guns. This test shall be performed by connecting an air hose first to the fluid inlet and then to the air inlet of the gun (so designed). With the gun used with the type A outfit, air pressure of the pressure used in normal operation) shall be applied and the gun nozzle immersed in water. Leakage beyond 50 bubbles per minute in the test shall be considered excessive and cause for rejection (see 3.7.2.3a, 3.7.2.4, and 3.8.2.3). The trigger of the gun shall be actuated three times for 30-second cycles to ensure correct reseating performance of the valves.
b. Tests on outfits. Each of the connections on the outfits shall be similarly tested by immersion in water in an endeavor to determine that all connections are airtight. Pressure tanks and compressor connections shall be tested by application of a leak test solution or other means to visually indicate the presence of air leakage. Leakage shall be cause for rejection.

4.5.1.2 Operation test. The outfit shall be placed in actual operation to determine the ability of the components to function satisfactorily under all conditions specified in section 3, when spraying fluid (see 3.6.2). A standard flowmeter shall be used to register the quantity of air consumed for operation (see 3.6.2 and 3.6.3).

4.5.1.3 Dielectric test. Cable assembly tests for dielectric strength shall be tested in accordance with the requirements of UL-817.

4.5.2 Spray gun tests.

4.5.2.1 Siphon-pressure type gun (type A outfit). The gun shall not require more than 12 ft^3/min (0.005 66 m^3/s) of air per minute at not more than 50 psi (344 kPa) pressure (see 4.5.6). The nozzle shall deliver fully atomized patterns ranging from 2 to 3 inches (51 to 76 mm) for narrow patterns and 6 to 8 inches (152 to 203 mm) for wide patterns, without splitting or spattering the spray pattern (see 3.7.2.3a) when spraying a pigmented material having a viscosity of 22 seconds, using a number 4 Ford cup at 72 °F (22.2 °C). The gun shall be held perpendicular to and at a distance of 8 inches (203 mm) from the surface being sprayed.

4.5.2.2 Pressure-constant bleed-type gun (type B outfits). The gun shall not require more than 1.7 ft^3/min (0.000 80 m^3/s) of air per minute at not more than 40 psi (275 kPa) pressure (see 4.5.6). Using the nozzle which produces a flat shaped spray pattern, the spray pattern shall be fully atomized and not less than 6 inches (152.4 mm) wide when the gun is held 7 inches

(177.8 mm) from and perpendicular to the surface being sprayed. Under these conditions, there shall be no splitting or spattering of the spray pattern when spraying any paint material for which the gun is intended, as specified (see 3.6.2 and 3.6.3).

4.5.2.3 Hardness tests. Needle and valve hardness tests shall be performed to determine conformance (see 3.7.2.7), or the supplier shall provide certification of conformance with the hardness requirements of this specification.

4.5.3 Compressor tests.

4.5.3.1 Compressor (type B outfit). The compressor shall be tested in accordance with the ASME Performance Test Code for Displacement Compressors, Vacuum Pumps, and Blowers. Inability of the compressor to deliver the capacity and pressures (see 3.8.5) shall constitute failure of this test.

a. Endurance test. After satisfactory completion of the tests (see 4.5.3.1), the compressor shall be subjected to an endurance test of 300 hours of continuous operation (no running period to be less than 8 hours) at capacity of not less than 1.7 ft^3/min (0.000 80 m^3/s), at not less than 40 psi (275 kPa) pressure. Failure to supply the specified capacity and pressure for the duration of this test shall constitute test failure. Failure of any part requiring more than 1 hour to remove and replace, or a second failure of any part, shall constitute test failure.
b. Final test. After completion of the endurance test, the compressor shall be tested as specified in 4.5.3.1. Failure to meet the test requirements will constitute test failure.

4.5.4 Gages and regulators. Gages and regulators used with the outfits shall be tested to verify accuracy in accordance ASME B40.1.

4.5.5 Pressure test. Pressure tests shall be performed to determine the ability of the various components of each outfit to withstand the specified pressures (see 3.7.2, 3.7.6, 3.7.6.1, 3.8.3, 3.9, and 3.9.3). Pressure tests shall also be performed on the completely assembled outfits to determine their ability to withstand the specified pressures (see 4.5.2.1 and 4.5.2.2).

5. PACKAGING

5.1 Packaging requirements. The preservation, packing, and marking shall be as specified in the contract or order.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use.

6.1.1 Type A. Type A standard paint spray outfits are intended for general use where a source of compressed air is available.

6.1.2 Type B. Type B lightweight paint spray outfits are intended for miscellaneous work where compressed air is not readily available and where outfits are required to be of such size that they can be readily carried from place to place by one person.

6.2 Acquisition data. Acquisition documents should specify the following:

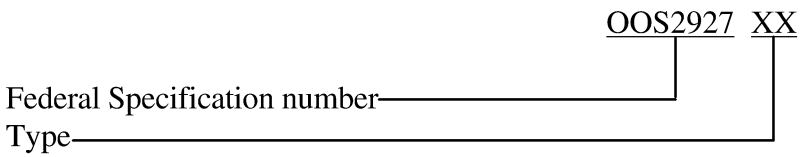
a. Title, number, and date of this specification.
b. Type required (see 1.2).
c. When first article inspection is required (see 3.2 and 4.2.1).
d. When hose connection threads are to be other than as specified (see 3.5.2).
e. Parts required for type A outfits (see 3.7.1).
f. Whether gun with detachable or integral head is required (see 3.7.2.2).
g. If extension nozzle is required (see 3.7.3).
h. Dimensions of material or fluid hose, if other than as specified (see 3.7.6.1).
i. If extension guns and handles are required (see 3.7.8).
j. Length of extension handle or gun required (see 3.7.8.1 and 3.7.8.2).
k. If material hose and pressure tank are required for type B outfits, and lengths of air and material hose to be supplied (see 3.8.1 and 3.8.4).
l. Power supply required for electric motor (see 3.8.6.1).
m. When switch enclosure is to be provided for use in a hazardous location (see 3.8.6.2).
n. Size and number of tanks required for type A (see 3.9).
o. Type of agitator, if required (see 3.9.2).
p. If tank truck is required (see 3.10).
q. When spray outfits shall be treated and painted other than as specified (see 3.13).

6.3 First article. When a first article inspection is required, the item will be tested and should be a first article sample or it may be a standard production item from the contractor's current inventory as specified in 4.2.1. The first article should consist of one unit. The contracting officer should include specific instruction in acquisition documents regarding arrangements for examination, test, and approval of the first article.

6.4 Supersession data. This specification replaces Military Specification MIL-S-15297H, dated 30 April 1993.

6.5 Classification cross reference. Classification used in this specification (see 1.2) are identical to those found in the superseded Military Specification, MIL-S-15297H.

6.6 Part or identifying number (PIN). The specification number, class, type, and size are combined to form PINs for spray outfits covered by this document (see 1.2). PINs for the spray outfits are established as follows:



6.6.1 Types. The types of the spray outfits (see 1.2) are identified by a two-digit number as follows:

Type A: - 01 Type B: - 02

6.7 Subject term (key word) listing.

Air
Air compressor
Gun
Pressure

6.8 Subcontracted material and parts. The preparation for delivery requirements of referenced documents listed in section 2 do not apply when material and parts are procured by the supplier for incorporation into the equipment and lose their separate identity when the equipment is shipped.

MILITARY INTERESTS:

Custodians:
Navy - YD1
Air Force - 99
Army - AL

Review Activity:
DLA - CS

CIVIL AGENCY COORDINATING ACTIVITIES:

GSA-FSS
HHS

Preparing Activity:
Navy - YD1

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